

REMARKS

Claims 32-41 were rejected under 35 USC 102 (e) as anticipated by or, in the alternative, under 35 USC 103 (a) as obvious over Zhou et al. '775. Applicant submits that Zhou et al. '775 fails to anticipate or render obvious the present invention.

Zhou et al. '775 is directed to a particle supported noble metal catalyst material in which the "...noble metal atoms... form widely dispersed minute noble metal crystals." See Abstract. Zhou et al. '775 teaches that the noble metal crystal particles in the catalyst are minute. See column 3, lines 10-11. The particle size of the noble metal, minute crystals are from 1-100 nanometers (from  $1 \times 10^{-9}$  to  $1 \times 10^{-7}$  meters). Thus, Zhou et al. '775 discloses the formation of minute crystals of the noble metal catalyst in order to expose the desired crystal phases or faces as a critical factor for improving the catalyst. There is no teaching of the formation of clusters of noble metal crystals on the support as claimed in the present invention. A person of skill in the art reading Zhou et al. '775 would be directed away from forming clusters of noble metal crystals by the teaching the formation of minute crystals that expose the faces is critical. The present invention is directed to the discovery that clusters of noble metal crystals of between 0.1  $\mu\text{m}$  to 20  $\mu\text{m}$  ( $1 \times 10^{-7}$  to  $2 \times 10^{-5}$  meters) provides a catalyst which exhibits improved productivity and selectivity.

Claims 32-41 of the present invention are directed to the discovery that formation of a noble metal catalyst on an appropriate support as relatively large clusters of catalyst crystals provides a catalyst which exhibits an improved activity. One method of forming clusters of catalyst crystals is through slow evaporation of the stock from the impregnated support. In the examples of the present application, a supported catalyst in accordance with the present invention provides significantly better selectivity and/or conversion. Compare trials numbered 1 or 2 to 4 (where selectivity increased by at least 11 percentage points) and 4 to 7 (where conversion increased by almost 20 percentage points) in Table 1. Comparison of trials number 1 or 2 to 3 show the impact of the bromide/bromine treatment of the present invention. The data shows that catalyst prepared in accordance with the process of the present invention which results in the formation of clusters of catalyst crystals, exhibited increased selectivity and/or conversion. In a commercial setting

producing large volumes of hydrogen peroxide, even a small increase in conversion and/or a selectivity is significant.

In view of the foregoing, applicant submits that Zhou et al. '775 fails to anticipate or render obvious the present invention and withdrawal of the rejection is in order.

Claims 32-40 were rejected under 35 USC 102 (b) as anticipated by, or in the alternative, under 35 USC 103 (a) as obvious over Birbara et al. '488. Applicant submits that Birbara et al. '488 fails to anticipate or render obvious the present invention.

Birbara et al. '488 discloses a catalyst for oxidizing aqueous organic contaminants. The catalyst includes noble metal crystals of 100 angstrom or smaller (about  $1 \times 10^{-8}$  meters or smaller). Birbara et al. '488 discloses the formation of the crystals of 100 angstroms or smaller which should be uniformly distributed on the surface of the catalyst support. Column 4, lines 1-3. Birbara et al. '488 is devoid of any teaching of the formation of clusters of catalyst crystals of  $1 \times 10^{-7}$  to  $2 \times 10^{-5}$  meters in size. The teachings of Birbara et al. '488 are that significantly smaller catalyst crystals are required and that rather than clusters, uniform distribution of the crystals is required.

Applicant submits that Birbara et al. '488 fails to anticipate or render obvious the present invention and the rejection should be withdrawn.

Claims 15-41 were rejected under 35 USC 102(e) as anticipated by or, in the alternative, under 35 USC 103 (a) as obvious over Sellin et al. '128. Applicant submits that Sellin et al. '128 fails to anticipate or render obvious the present invention.

Sellin et al. '128 discloses a method of producing a catalyst wherein a solution of a salt of the catalytically active material and a reducing agent is used to treat a porous support. There is no disclosure of a stepwise, sequential process to produce a catalyst on a support. The present invention is directed toward a sequential process that produces the unique catalyst of the present

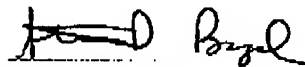
invention. The process of the present invention comprise first impregnating the support with a solution of a salt of the metal catalyst. Thereafter, the impregnated support is subjected to a reduction process and thereafter treated with an aqueous acid solution containing bromine and bromide ions.

Sellin et al. '128 fails to disclose either expressly or by implication such a sequential process and in fact teaches a mixing of the salt of the catalyst, the reducing agent and a halide into a single solution. The present application is directed to the sequential treatment process claimed which produces the clusters of catalyst crystals claimed which result in a supported catalyst of enhanced properties.

In view of the forgoing comments, applicant submits that claims 15-41 are in condition for allowance and prompt favorable action is solicited.

Respectfully submitted,

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